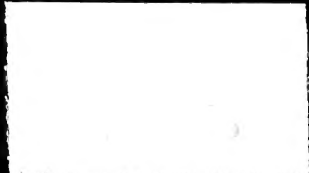
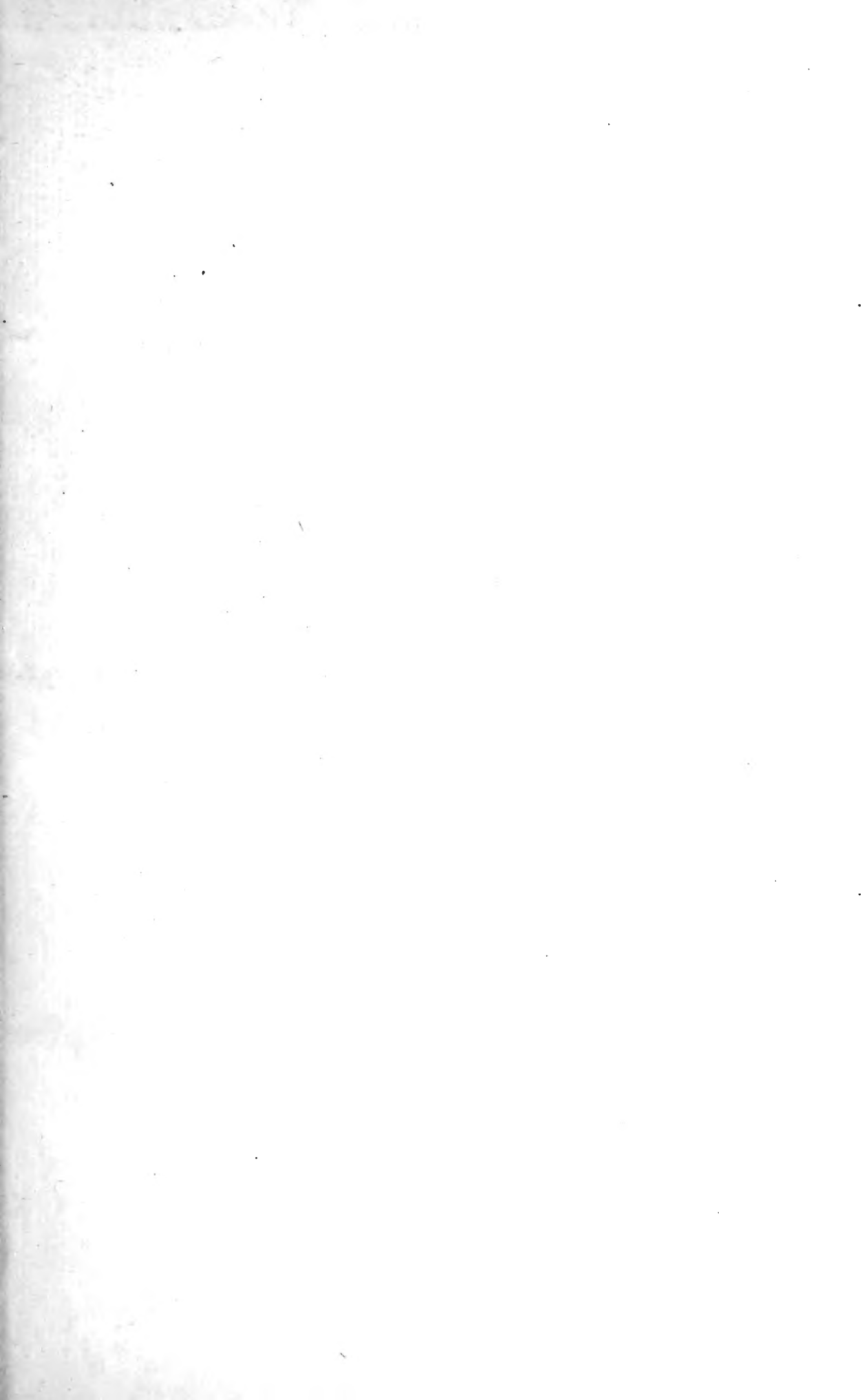


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OF

THE MORE IMPORTANT CONTRIBUTIONS

TO

AMERICAN ECONOMIC ENTOMOLOGY.

PREPARED BY AUTHORITY OF THE SECRETARY OF AGRICULTURE,

BY

SAMUEL HENSHAW.

PART IV.

THE MORE IMPORTANT WRITINGS

OF

GOVERNMENT AND STATE ENTOMOLOGISTS,

AND OF

OTHER CONTRIBUTORS TO THE LITERATURE OF AMERICAN
ECONOMIC ENTOMOLOGY.

A - K .

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1895.

FORTY-SEVENTH CONGRESS, FIRST SESSION.

CONGRESS OF THE UNITED STATES,
IN THE HOUSE OF REPRESENTATIVES,

June 24, 1882.

Resolved, By the House of Representatives (the Senate concurring), that there be printed, for the use of the Department of Agriculture, one thousand copies of a special report entitled "Bibliography of Economic Entomology."

Attest:

EDW. MCPHERSON, *Clerk.*

Passed the Senate July 6, 1882.

F. E. SHOBER, *Acting Secretary.*

A true copy.

EDW. MCPHERSON, *Clerk.*

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* Dr. Fitch was born at Fitch's Point, Salem, N. Y., 24 February, 1809, and died 18 April, 1879, at Salem, N. Y. See Amer. Ent., May, 1880, v. 3, n. s., v. 1, pp. 121-123.

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520. FITCH, A. Insects injurious to vegetation.—No. 3. The wheat fly. <Amer. Quart. Journ. Agric. and Sci., 1845, v. 2, pp. 233–264. Reprint: <Trans. N. Y. State Agric. Soc. for 1845, 1846, v. 5, pp. 255–291, pl. 5. Separate: <Albany, 1846, pp. 38, 1 pl. 5. See: <Amer. Agric., January, 1846, v. 5, p. 37. <Amer. Farmer, February, 1846, s. 4., v. 1, pp. 243–245. <Froriep Notiz, 1847, v. 4, p. 344. <Gardeners' Chronicle, 1847, p. 604, fig. History, habits, enemies, and means against *Cecidomyia* [= *Diplosis*] *tritici*; description of all stages; descriptions and figures of *C.* [= *D.*] *caliptera*, *C.* [= *D.*] *thoracica*, *C.* [= *D.*] *tergata*, and description of *C. cerealis* [= *D. caliptera*].

521. FITCH, A. On the wheat fly and chinch bug. <Ohio Cultivator, 1 February, 1846.

522. FITCH, A. Insects injurious to vegetation.—No. 4. The Hessian fly. <Amer. Quart. Journ. Agric. and Sci., October, 1846, v. 4, pp. 244–264, pl. See: <Amer. Farmer, December, 1846, s. 4, v. 2, pp. 179–183.

Treats of *Cecidomyia destructor*; its introduction into America; its history and bibliography; its name and synonyms; figures larva, pupa and imagos, and normal and injured wheatstalks.

523. FITCH, A. Insects injurious to vegetation.—No. 5. The Hessian fly—continued. <Amer. Quart. Journ. Agric. and Sci., January, 1847, v. 5, pp. 1–27. See: Amer. Farmer, January, 1847, s. 4, v. 2, p. 204: <Amer. Quart. Journ. Agric. and Sci., April, 1847, v. 5, pp. 206–208.

Treats of *Cecidomyia destructor*; describes all stages; its habits, transformations, parasites, and remedies.

524. FITCH, A. The grain moth—*Tinea granella*. <The Cultivator, January, 1847, n. s., v. 4, pp. 13–14.

Description, habits, transformations, and remedies; remarks upon *Gelechia cerealella*.

525. FITCH, A. List of noxious insects. <Amer. Quart. Jour. Agric. and Sci., September, 1847, v. 6, pp. 145–152.

List of insects injurious to: 1. Cereal plants, 28 species; 2. Grass and clover, 23 species; 3. Garden vegetables, 38 species; 4. Flowers; 5. Orchards; 6. Forest trees; 7. Domestic animals; 8. Dwellings; 9. Man.

Descriptions and histories of *Atropos pulsatorius*, *Psocus tritici*, *Podura* [= *Achorutes*] *nivicola*, and *Otiocerus coquebertii*.

526. FITCH, A. The Hessian fly; its history, character, transformations, and habit <Trans. N. Y. State Agric. Soc., for 1846, 1847, v. 6, pp. 316–373, 1 pl. Separate: <Albany, 1846, pp. 63, 1 pl. <Albany, 1847, pp. 60, 1 pl.

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527. FITCH, A. The currant-moth, *Abraxas*? [= *Eufitchia*] *ribearia*. <Trans. N. Y. State Agric. Soc., for 1847, 1848, v. 7, pp. 461-469, pl., 11 figs. Separate: <Albany, 1848, pp. 11, 1 pl. Extract: <Trans. Ent. Soc., London, 1851, s. 2, v. 1, pp. 106-107, Proc. Describes and figures the larva, pupa, and imago; habits and transformations; injuries and remedies.
528. FITCH, A. [Insect enemies of domestic animals.] <Trans. N. Y. State Agric. Soc., for 1849, 1850, v. 9, pp. 797-804. Popular account of *Melophagus ovinus*, *Ornithomyia avicularia*, *Æstrus* [= *Gastrophilus*] *equi*, *Æ.* [= *G.*] *nasalis*, *Hypoderma bovis*, *Cephalemyia* [= *Æstrus*] *ovis*, *Lucilia cæsar*, *L.* [= *Pyrellia*] *cadaverina*, *Calliphora vomitoria*, *C. fulvibarbis*, *Musca domestica*, and *Stomoxys calcitrans*; means against sheep maggots.
529. FITCH, A. Wheat insects—Joint worm. <The Cultivator, October, 1851, n. s., v. 8, pp. 321-324. Comparative characters of *Isosoma hordei*, *Cecidomyia destructor*, and *C. culmicola*.
530. FITCH, A. [Insect injurious to fruit trees.] <Journ. N. Y. State Agric. Soc., September, 1852, v. 3, p. 37. A beetle resembling *Leptura vittata* has done much injury to fruit trees in Michigan.
531. FITCH, A. *Cantharis vittata*. <Journ. N. Y. State Agric. Soc. October, 1852, v. 3, p. 55. *Cantharis* [= *Epicauta*] *vittata* injurious to potato vines near Albany.
532. FITCH, A. Apple tree pests—Schönherr's weevil and the orchard moth. <Trans. N. Y. State Agric. Soc. for 1853, 1854, v. 13, pp. 178-187. See: <Salem Press, 12 July, 1854. <Journ. N. Y. State Agric. Soc., September, 1853, v. 4, pp. 36-39. Account of *Pachyrhynchus schönherri* [= *Ithycerus noveboracensis*] injuring buds and twigs of apple trees in Michigan and of larvæ of *Argyrolepia pomoriana* [= *Ypsolophus pomotellus*] stripping leaves from orchards in New York; description of *A. sylvaticana*, and of *Chætophilus* [= *Y.*] *con-tubernatellus*.
533. FITCH, A. Report [on the noxious, beneficial, and other insects of the State of New York]. <Trans. N. Y. State Agric. Soc. for 1854, 1855, v. 14, pp. 705-880, 28 figs. Separate: <Albany, 1855, pp. 180.*

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* The first and second reports were also issued under one cover with title and index. <Albany, 1856, pp. 336, pl. 1-4, 37 figs.

534. FITCH, A. [Entomology, No. 1.] Osage orange insect. <The Country Gentleman, 18 January, 1855, v. 5, pp. 38-39, fig.
Treats of *Lecanium* sp. [= *Pulvinaria innumerabilis*]; description, figures, habits, and remedies.
535. FITCH, A. Plum tree caterpillars. <The Country Gentleman, 12 April, 1855, v. 5, p. 234.
Means against *Clisiocampa americana* and *Orgyia leucostigma*.
536. FITCH, A. [Entomology, No. 2.] The hunter weevil. <The Country Gentleman, 14 June, 1855, v. 5, p. 373. <The Cultivator, July, 1855, s. 3, v. 3, p. 221.
Characters of Sphenophori; *Sphenophorus venatus* [† = *sculptilis*] injurious to the leaves of corn.
537. FITCH, A. Entomology, No. 4. The apple plant-louse. <The Country Gentleman, 19 July, 1855, v. 6, p. 48. <The Cultivator, September, 1855, s. 3, v. 3, pp. 278-279.
Number of species of plant-lice and bark-lice infesting the apple; description and natural history of *Aphis mali*; its enemies and remedies.
538. FITCH, A. [Entomology, No. 3.] The chinch bug. <The Cultivator, August, 1855, s. 3, v. 3, p. 238.
Origin of the name chinch bug; *Lygæus leucopterus* referred to the genus *Micropus* [= *Blissus*].
539. FITCH, A. Entomology, No. 5. Insects which destroy plant-lice. <The Country Gentleman, 1855, v. 6; 6 September, p. 158; 13 September, pp. 174-175.
Habits of Coccinellidæ, Hemerobiidæ, and Syrphidæ; oviposition and development of *Aphidius* sp.; means against Aphididæ.
540. FITCH, A. Entomology, No. 6. Gaylord's wheat caterpillar. <The Country Gentleman, 22 November, 1855, v. 6, p. 331. <The Cultivator, January, 1856, s. 3, v. 4, p. 19.
Habits of an undetermined lepidopterous larva injurious to kernels of wheat.
541. FITCH, A. Entomology, No. 7. The wheat Thrips and three-banded Thrips. <The Country Gentleman, 13 December, 1855, v. 6, p. 385.
Characters of Thripidæ; describes the several stages of *Thrips tritici* injurious to blossoms of wheat and clover in Wisconsin; describes *Coleothrips trifasciata* common on wheat and flowers of tansy in New York.
542. FITCH, A. Entomology, No. 8. Cutworms. <Country Gentleman, 1856, v. 7; 6 March, pp. 154-155; 15 March, p. 171. <The Cultivator, April, 1856, s. 3, v. 4, pp. 115-116.
Life habits of cutworms; means against their ravages; description of *Agrotis subgothica* and of *A.* [= *Hadena*] *devastatrix*.
543. FITCH, A. Entomology, No. 9. The American vaporor moth. <The Country Gentleman, 1856, v. 7; 3 April, pp. 217-218; 10 April, p. 235. <The Cultivator, May, 1856, s. 3, v. 4, pp. 154-156.
Description of all stages of *Orgyia leucostigma*; ravages and remedies; describes *Trichogramma?* *orgyiae* and *T.?* *fraterna*.

544. FITCH, A. Entomology, No. 10. Borer in apple trees. The Buprestis. <The Country Gentleman, 10 July, 1856, v. 8, p. 27. <The Cultivator, August, 1856, s. 3, v. 4, pp. 240-241. Habits and ravages of and means against *Chrysobothris femorata*.
545. FITCH, A. Entomology, No. 12. The rose bug. <The Country Gentleman, 31 July, 1856, v. 8, pp. 75-76. <The Cultivator, September, 1856, s. 3, v. 4, pp. 270-271. Natural history, description, food plants, and enemies of *Macroductylus sub-spinosus*; remedies.
546. FITCH, A. The joint-worm in barley. <Journ. N. Y. State Agric. Soc., December, 1856, v. 7, p. 76. *Eurytoma* [= *Isosoma*] *hordei* destructive to barley in Cazenovia, N. Y.
547. FITCH, A. Report on the noxious, beneficial, and other insects of the State of New York. <Trans. N. Y. State Agric. Soc. for 1855, 1856, v. 15, pp. 409-559, pl. 1-4, 9 figs.*

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548. FITCH, A. Third report on the noxious and other insects of the State of New York. <Trans. N. Y. State Agric. Soc., for 1856, 1856, v. 16, pp. 315-490, pl. 1-4, 1 fig. †

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* See note under No. 533.

† The third, fourth, and fifth reports were also issued under one cover with title and index. <Albany, 1859, pp. 7 + 170 + 67 + 74 + 11, pl. 1-4, 14 fig.

548. FITCH, A.—Continued.

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549. FITCH, A. Entomology, No. 13. The prickly *Leptostylus*—a worm under the bark of apple trees. <The Country Gentleman, 29 January, 1857, v. 9, p. 78. <The Cultivator, March, 1857, s. 3, v. 5, pp. 77–78.

Ravages of and means against *Leptostylus aculiferus*.

550. FITCH, A. Entomology, No. 14. Insects embedded in the interior of wood. <The Country Gentleman, 26 March, 1857, v. 9, pp. 201–202. <The Cultivator, May, 1857, s. 3, v. 5, pp. 138–139.

Description of the larva and pupa of *Tremex columba*; food habits.

551. FITCH, A. Entomology, No. 15. Grasshoppers. <The Country Gentleman, 16 July, 1857, v. 10, pp. 42–43. <The Cultivator, August, 1857, s. 3, v. 5, pp. 245–246.

Ravages of an acridian [probably *Caloptenus spretus*] in Scott County, Minn.; means of controlling locust ravages.

552. FITCH, A. Weevil in seeds from the Patent Office. <Journ. N. Y. State Agric. Soc., July, 1857, v. 8, p. 29.

Destructiveness of *Calandra granaria*.

553. FITCH, A. Entomology, No. 16. The hunter weevil in young corn. Beetles upon and worms in potato vines. Gooseberry insects. <The Country Gentleman, 6 August, 1857, v. 10, p. 91. <The Cultivator, September, 1857, s. 3, v. 5, p. 273.

Means against *Sphenophorus venatus* [†=*sculptilis*]; identifies *Cantharis atrata* [= *Epicauta pennsylvanica*] and *Gortyna* sp. [= *nitela*] as injurious to potato vines; an undetermined larva infesting gooseberries.

554. FITCH, A. Slug worm. <The Country Gentleman, 27 August, 1857, v. 10, p. 145.

Means against *Selandria* [= *Eriocampa*] *cerasi*.

555. FITCH, A. The May beetle. <The Genesee Farmer, August, 1857, s. 2, v. 18, pp. 239–241.

Ravages of and means against *Lachnosterna fusca*.

556. FITCH, A. Wheat midge. <Journ. N. Y. State Agric. Soc., November, 1857, v. 8, pp. 67–68.

Measures necessary for the importation of the European parasite of *Cecidomyia* [= *Diplosis*] *tritici*.

557. FITCH, A. Entomology, No. 16, bis. Experiments. Soap on apple trees.—Powdered charcoal on cucumber plants. <The Country Gentleman, 8 July, 1858, v. 12, p. 15. <The Cultivator, August, 1858, s. 3, v. 6, pp. 238–239.

Means against *Abraxas*? [= *Eufitchia*] *ribearia*; efficacy of soap against *Saperda bivittata* [= *candida*]; failure of powdered charcoal against *Dia-brotica vittata* and usefulness of boxes against the same and other insect depredators.

558. FITCH, A. Injurious insect on the oak. <The Country Gentleman, 5 August, 1858, v. 12, p. 74.
Characters of *Dryocampa stigma*?; remedies.
559. FITCH, A. Entomology, No. 17. The fall web-worm. <The Country Gentleman, 14 October, 1858, v. 12, p. 239. <The Cultivator, November, 1858, s. 3, v. 6, pp. 341-342.
Natural history and food plants of *Hyphantria textor* [= *cunea*]; describes the same and *H. punctata* [= *cunea*] and *H. cunea*.
560. FITCH, A. Wheat midge. <Trans. N. Y. State Agric. Soc., for 1857, 1858, v. 17, pp. 319-320.
Identity of *Cecidomyia* [= *Diplosis*] *tritici* of Europe and America; absence of parasites in America.
561. FITCH, A. Fourth report on the noxious and other insects of the State of New York. <Trans. N. Y. State Agric. Soc. for 1857. 1858, v. 17, pp. 687-814, 4 figs.*

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562. FITCH, A. Entomology, No. 18. The golden tortoise beetle. <The Country Gentlemen, 20 January, 1859, v. 13, p. 50, fig.
Food-plants, description and figures of *Coptocycla aurichalcea*.
563. FITCH, A. A new barley insect. <The Country Gentlemen, 21 April, 1859, v. 13, p. 250. <The Cultivator, May 1859, s. 3, v. 7, p. 148.
Pteromalus? *tritici* [= *Isosoma hordei*] bred from barley joints; distinctive characters of *P. hordei*, *P. tritici* and *P. fulvipes* [all = *I. hordei*].
564. FITCH, A. A new barley insect. <Journ. N. Y. State Agric. Soc., April, 1859, v. 10, pp. 114-115.
Pteromalus? *tritici* [= *Isosoma hordei*] proposed as name for species bred from barley straw.
565. FITCH, A. The thousand-legged worm. <The Country Gentleman, 14 July, 1859, v. 14, p. 27. <The Cultivator, August, 1859, s. 3, v. 7, p. 254.
Abundance of an undetermined *Julus*; means against the same; list of plants injured.
566. FITCH, A. Entomology, No. 19—Beetles infesting grape-vines. <The Country Gentleman, 15 September, 1859, v. 14, p. 171.
Description and figure of *Pelidnota punctata*; describes *Anomala lucicola* and its varieties; brief notes on *Macroductylus subspinosus*; natural history and means against *Haltica chalybea*.

* See note under No. 548.

567. FITCH, A. Entomology, No. 20—The parasitic destroyer of the Curculio. <The Country Gentleman, 6 October, 1859, v. 14, p. 221. <The Cultivator, November, 1859, s. 3, v. 7, pp. 340-341. Food habits of *Conotrachelus nenuphar*; characters of the families of hymenopterous parasites; describes and figures *Sigalphus curculionis*; its habits.
568. FITCH, A. Maple leaf-cutter. <The Country Gentleman, 6 October, 1859, v. 14, p. 225. <The Cultivator, November, 1859, s. 3, v. 7, pp. 330-331.
Relates to *Ornix* [= *Incurvaria*] *acerifoliella*.
569. FITCH, A. Fifth report on the noxious and other insects of the State of New York. <Trans. N. Y. State Agric. Soc. for 1858, 1859, v. 18, pp. 781-854, 9 fig.*

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570. FITCH, A. Entomology, No. 21—Locust leaf-miners. <The Country Gentleman, 2 February, 1860, v. 15, p. 82.
Describes and figures the mines in locust leaves made by an undetermined insect.
571. FITCH, A. The Entomologist, No. 22—The seventeen-year Cicada. <The Country Gentleman, 29 March, 1860, v. 15, p. 210.
Remarks on popular names for insects; regularity of appearance of *Cicada* [= *Tibicen*] *septendecim*; necessity of ascertaining its distribution in order to predict its future visitations.
572. [FITCH, A.] Interesting lecture on insects. <Amer. Farmer, April, 1860, ser. 5, v. 1, pp. 312-313.
573. FITCH, A. The hunter weevil. <The Country Gentleman, 14 June, 1860, v. 15, p. 384.
Identifies *Sphenophorus venatus* [† = *sculptilis*] as the corn-bug of the Patent Office Report for 1854.
574. FITCH, A. The apple insect. <The Country Gentleman, 12 July, 1860, v. 16, pp. 32-33. <The Cultivator, August, 1860, ser. 3, v. 8, p. 260.
Characters of *Ithycerus noveboracensis*.
575. FITCH, A. The Entomologist, No. 23—The striped flea-beetle. <The Country Gentleman, 12 July, 1860, v. 16, p. 36. <The Cultivator, December, 1860, s. 3, v. 8, pp. 270-271.
Ravages, habits, food-plants and means against *Phyllotreta striolata* [= *vittata*]; description and synonymy of the same.

* See note under No. 548.

576. FITCH, A. Ravages of insects on forest and fruit trees. Remedy. <Journ. N. Y. State Agric. Soc., July, 1860, v. 11, pp. 21-22. <Trans. N. Y. State Agric. Soc. for 1859, 1860, v. 19, pp. 775-776. Reprint: <Cultivator and Country Gentleman, 25 July, 1878, v. 43, p. 471.
Ravages, natural history, and means against *Lecanium aceris* [= *Pulvinaria innumerabilis*].
577. FITCH, A. The Entomologist, No. 24—The pear blight beetle. <The Country Gentleman, 8 November, 1860, v. 16, p. 302. <The Cultivator, December, 1860, s. 3, v. 8, p. 371.
Description of *Scolytus pyri* [= *Xyleborus dispar*]; its food-plants, habits, and remedies.
578. FITCH, A. Address on our most pernicious insects, delivered at the annual meeting [of the State Agricultural Society], February, 1859. <Trans. N. Y. State Agric. Soc. for 1859, 1860, v. 19, pp. 588-598.*
Treats of five species injurious to wheat and of four injurious to fruit trees; the former are *Diplosis tritici*, *Calandra granaria*, *Cecidomyia destructor*, *Isosma hordei*, and *Blissus leucopterus*; the latter are *Clisiocampa americana*, *Saperda candida*, *Sannina exitiosa*, and *Conotrachelus nenuphar*.
579. FITCH, A. Address of Asa Fitch, M. D., Entomologist of the Society, on the Curculio and black knot on plum trees. <Trans. N. Y. State Agric. Soc. for 1859, 1860, v. 19, pp. 599-612.†
Describes *Conotrachelus nenuphar*; its times of appearance, ravages, parasites, and remedies.
580. FITCH, A. The Entomologist, No. 25—The quince Tingis. <The Country Gentleman, 14 February, 1861, v. 17, p. 25.
Describes and figures *Tingis cydonia*; its habits and injuries; description of the immature form; use of the hydropult.
581. FITCH, A. The Entomologist, No. 26—The wheat midge. <The Country Gentleman, 1 April, 1861, v. 17, p. 226. <The Cultivator, May, 1861, s. 3, v. 9, pp. 150-151.
Habits and transformations of *Cecidomyia* [= *Diplosis*] *tritici* and *C. cerealis* [= *D. caliptera*].
582. FITCH, A. The Entomologist, No. 27—Disappearance of the wheat midge. <The Country Gentleman, 2 May, 1861, v. 17, p. 290. <The Cultivator, June, 1861, s. 3, v. 9, p. 178. <Amer. Farmer, June, 1861, s. 5, v. 2, pp. 378-379.
Portions of eastern New York, Vermont, and Canada west, exempt from the attacks of *Cecidomyia* [= *Diplosis*] *tritici*.
583. FITCH, A. The Entomologist, No. 28—The apple tree borer. <The Country Gentleman, 6 June, 1861, v. 17, p. 370. <The Cultivator, July, 1861, s. 3, v. 9, p. 209.
Description of *Bostrichus* [= *Amphicerus*] *bicaudatus*; its distribution, ravages and means against it.

* Nos. 578-579 were published separately with half title cover. <Albany, 1860, 8 vo., pp. 28.

† See note under No. 578.

584. FITCH, A. The army-worm and cut-worm. <The Country Gentleman, 4 July, 1861, v. 18, p. 18.
Habits of cut-worms (larvæ of Noctuidæ); the army-worm probably a gregarious and migratory cut-worm.
585. [FITCH, A.] The cut-worm and corn-grub killer. <The Country Gentleman, 11 July, 1861, v. 18, p. 33. <The Cultivator, August, 1861, ser. 3, v. 9, p. 259.
Characters and habits of *Calosoma calidum*.
586. FITCH, A. The Entomologist, No. 29—The army-worm moth. <The Country Gentleman, 25 July, 1861, v. 18, p. 66. <The Cultivator, September, 1861, s. 3, v. 9, pp. 278–279.
History of the identification of the army-worm moth as *Leucania unipuncta*; description of the same.
587. FITCH, A. The hunter weevil. <The Country Gentleman, 1 August, 1861, v. 18, p. 80. <The Cultivator, September, 1861, s. 3, v. 9, p. 268.
Ravages of *Sphenophorus venatus* [= *sculptilis*.]
588. FITCH, A. The grain Aphis. <The Country Gentleman, 8 August, 1861, v. 18, p. 96. <The Cultivator, September, 1861, s. 3, v. 9, p. 290.
Ravages of *Aphis avenæ* [= *Nectarophora granaria*]; its manner of attack; enemies and remedies.
589. FITCH, A. The Entomologist, No. 30—The grain Aphis. <The Country Gentleman, 15 August, 1861, v. 18, p. 114.
Habits, parasites, and enemies of *Aphis avenæ* [= *Nectarophora granaria*]. *Cecidomyia* [= *Diplosis*] *tritici* injurious to wheat in eastern New York; recommends the importation of its natural parasites.
590. FITCH, A. Snapping beetle—Blight on apple trees. <The Country Gentleman, 22 August, 1861, v. 18, p. 130. <The Cultivator, September, 1861, s. 3, v. 9, p. 294.
Undetermined elaterid not the cause of blight in apple trees.
591. FITCH, A. The new insect in rye. <Amer. Agric., August, 1861, v. 20, pp. 235–236.
Ravages of *Eurytoma* [= *Isosoma*] *hordei*; comparative characters and habits of allied species.
592. FITCH, A. The army worm's parasite. <The Cultivator, August, 1861.
Describes *Ichneumon leucaniæ*.
593. FITCH, A. The locust insect. <The Country Gentleman, 5 September, 1861, v. 18, p. 161.
Characters of *Hispa scutellaris* [= *Odontota dorsalis*.]
594. FITCH, A. An important caution. <The Country Gentleman, 5 September, 1861, v. 18, p. 161. <The Cultivator, October, 1861, ser. 3, v. 9, p. 303.
Injuries to animals from feeding in grain fields infested with grain aphidids and their attendant coccinellids.

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Food-plants, characters, and means against *Cantharis* [= *Epicauta*] *pennsylvanica*.
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Ravages of *Aphis avenæ* [= *Nectarophora granaria*]; its characters and means against its ravages.
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Observations made during 1861 upon *Nectarophora granaria*, *Leucania unipuncta* and *Diplosis tritici*.
602. FITCH, A. The Entomologist, No. 31—Insect tumors and wounds in raspberry stalks. <The Country Gentleman, 22 May, 1862, v. 19, p. 335.
Habits and description of *Figites rubus-caulis*; its gall; oviposition of *Ceresa bubalus* [‡ = *Ecanthus niveus*] in raspberry, willow, and cherry.
603. FITCH, A. The Buffalo tree-hopper. <Amer. Agric., June, 1862, v. 21, p. 172.
Advance print of portion of the account concerning *Ceresa bubalus* given in the 12th Rept. on the insects of the State of New York. See No. 640.
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Ravages of *Crioceris asparagi* on Long Island; describes and figures the beetle and its larva; hand-picking as the remedy.
605. FITCH, A. The Entomologist. No. 33.—The maple Psocus, <The Country Gentleman, 4 September, 1862, v. 20, p. 162.
Describes *Psocus aceris* [= *venosus*]; its habits and food-plants.

* The sixth, seventh, eighth, and ninth reports were also issued under one cover with title and index. <Albany, 1865, pp. 260, pl. 1-4, 4 figs.

606. FITCH, A. The grain Aphis. <Prairie Farmer, 8 November, 1862, pp. 291-292. S.-b. No.2, pp. 102-103.
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607. FITCH, A. Insects the past year (1861). <Trans. N. Y. State Agric. Soc. for 1861, 1862, v. 21, pp. 27-31.
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608. FITCH, A. Seventh report on the noxious and other insects of the State of New York. <Trans. N. Y. State Agric. Soc. for 1861, 1862, v. 21, pp. 813-859, 1 pl.*

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Characters of *Anthomyia ceparum*; its habits, ravages, food-plants, and remedies.
610. FITCH, A. The May beetle. Worm on grape-vines. <The Country Gentleman, 18 June, 1863, v. 21, p. 399.
Lachnosterna fusca injurious to cherry and plum trees; remedies; description of *Spilosoma virginica*; its injuries to grape leaves; hand-picking as a remedy.
611. [FITCH, A.] The asparagus beetle. <Amer. Agric., June, 1863, v. 22, p. 166.
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613. FITCH, A. A brief account of the most important injurious insects of the United States. <Illustrated Annual of Rural Affairs. Separate: <Albany, 1863, pp. 6 + 293-321.
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614. FITCH, A. Insects. The grain Aphis, wheat midge, etc. <Trans. N. Y. State Agric. Soc. for 1862, 1863, v. 22, pp. 32-38.
Sudden appearance of *Aphis avenæ* [= *Nectarophora granaria*] in New York and New England; its extension westward; habits and enemies of the same; brief notes on *Cecidomyia* [= *Diplosis*] *tritici*.
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Clytus [= *Cyllene*] *robinia* occasionally attacks the honey locust; note on *Ctenucha latreillana* [= *virginica*].

* See note under No. 600.

616. FITCH, A. Borers in the honey locust. <Trans. N. Y. State Agric. Soc. for 1862, 1863, v. 22, pp. 117-118.
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617. FITCH, A. Eighth report on the noxious and other insects of the State of New York. <Trans. N. Y. State Agric. Soc. for 1862, 1863, v. 22, pp. 657-691, 2 figs.*

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Life history of *Aphis mali*.

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Sphenophorus venatus [† = *sculptilis*] injurious to young corn.

620. FITCH, A. The Entomologist, No. 34. The Buffalo tree-hopper. <The Country Gentleman, 16 June, 1864, v. 23, p. 386, figs.

Description of punctures in raspberry twig and of the eggs of *Ceresa bubalus* [† = *Ecanthus niveus*]; describes and figures *Ceresa* sp. and its eggs; description of its oviposition and the young insect; remedies.

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622. FITCH, A. The Entomologist, No. 35.—The Nebraska bee-killer. <The Country Gentleman, 28 July, 1864, v. 24, p. 63.

Description, habits, and odor of *Trupanea*. [= *Promachus*] *apivora*; habits of Asilidæ.

623. FITCH, A. A curious insect. <The Country Gentleman, 5 August, 1864, v. 24, p. 79.

Habits and food plants of *Enchenopa binotata*.

624. FITCH, A. Ninth report on the noxious and other insects of the State of New York. <Trans. N. Y. State Agric. Soc. for 1863, 1864, v. 23, pp. 778-823, 1 plate, 2 figs. Separate: <Albany, 1865, pp. 56.*

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626. FITCH, A. Plant lice. The hop aphis. <The Country Gentleman, 3 August, 1865, v. 26, p. 82.

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*See note under No. 600.

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Describes larva and imago of *Datana ministra*; remedies; history and description of *Anoplitis scutellaris* [= *Odontota dorsalis*]; larva of *Cynthia* [= *Pyra-meis*] *cardui* eating leaves of Canada thistle and parasitized by *Banchus* [= *Limneria*] *fugitiva*.

628. FITCH, A. Address delivered before the annual meeting of the State Agricultural Society, Albany, February 8, 1865. <Trans. N. Y. State Agric. Soc. for 1864, 1865, v. 24, pp. 111-116.

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629. FITCH, A. Tenth report on the noxious and other insects of the State of New York. <Trans. N. Y. State Agric. Soc., for 1864, 1865, v. 24, pp. 433-461, 1 pl., 3 figs.*

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632. FITCH, A. Grape beetle. <Rural American, 1 October, 1866. S.-b. No. 2, p. 12.

Characters, habits, and food-plants of *Pelidnota punctata*.

633. FITCH, A. The cotton worm. <The Country Gentleman, 18 October, 1866, v. 28, p. 257. S.-b. No. 2, p. 17.

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Natural history and figures of *Cecidomyia* [= *Diplosis*] *tritici*.

635. FITCH, A. Insects which injure grain crops.—II. The Hessian fly. <The Country Gentleman, 29 November, 1866, v. 28, p. 354. S.-b. No. 2, p. 37.

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* The tenth and eleventh reports were also issued under one cover, with title and index. <Albany, 1867, pp. 90, 18 figs.

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Habits and characters of *Æschna heros*.

642. FITCH, A. Grain Aphis in eastern Tennessee. <The Country Gentleman, 15 July, 1869, v. 34, p. 35.

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Characters, food plants, and life habits of myriopods.

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Brief notices of *Anthomyia ceparum*, *Cantharis* [= *Epicauta*] *vittata*, *Anthomyia raphani*; *A brassicæ*, Myriapoda (centipedes) Agrotidæ (cut-worms), Halticinæ (flea-beetles), *Smynturus hortensis*, *Cerostoma brassicella* [= *Plutella cruciferarum*] and *Pieris oleracea*.

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* See note under No. 629.

646. FITCH, A. Thirteenth report on the noxious, beneficial, and other insects of the State of New York. <Trans. N. Y. State Agric. Soc. for 1869, 1870, v. 29, pp. 495-566.

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Abundance of lampyrid larvæ on snow; their characters, habits, and the cause for their presence on the snow.

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649. FITZ, J. The codling moth. <The Country Gentleman, 1 August, 1872, v. 37, p. 486.

Means against *Carpocapsa pomonella*.

650. FLAGG, GEO. W. Lice on sheep. <New England Farmer, v. 53.

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Sketch of the family, with notes on the principal Canadian species of economic importance.

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General account, with special reference to some of the more common and injurious Canadian species.

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*Professor Forbes was born in Stephenson County, Ill., in 1844. See: <Trans. Ill. Hortic. Soc. for 1889-1890, n. s., v. 23, pp. 182-186.

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674. FORBES, S. A. A few notes on the food of the meadow lark. <Trans. Ill. Hortic. Soc., 1880, n. s., v. 14, pp. 234-237.
Food habits indicate the usefulness of the meadow lark.
675. FORBES, S. A. Supplementary note on the food of the blue-bird. <Amer. Nat., January, 1881, v. 15, pp. 66-67.
Food habits of *Sialia sialis* in August and September.
676. FORBES, S. A. The English sparrow in Illinois. <Amer. Nat., May, 1881, v. 15, pp. 392-393.
Relative amount of insect and of other food found in the stomach of *Passer domesticus*.
677. FORBES, S. A. The army worm. <Bloomington Pantagraph, 28 July, 1881.
Ravages of *Leucania unipuncta* in McLean and adjacent counties; natural history, injuries, and remedies.
678. FORBES, S. A. Birds and canker worms. <Amer. Agric., November, 1881, v. 40, pp. 482-483; January, 1882, v. 41, pp. 18-19.
General report of a study made of the effect of birds upon the multiplication of the canker worm in an orchard in Illinois.
679. FORBES, S. A. The relations of birds to horticulture. <Rept. Mo. State Hortic. Soc., 1880-81, pp. 170-184.
Food relations of the Turdidæ.
680. FORBES, S. A. The ornithological balance wheel. <Trans. Ill. State Hortic. Soc., 1881, n. s., v. 15, pp. 120-131. Extract: <Rept. State Hortic. Soc. Mich., 1881, p. 203. <Pacific Rural Press, 21 January, 1882. <Shawnee News, 13 February, 1882.
Relations of birds to army worms, canker worms, and chinch bugs.
681. FORBES, S. A. *Aphis viticola*. <Chicago Tribune, July, 1882.
Letter to a correspondent, describing *Aphis viticola*, noting parasites which accompanied examples sent, and mentioning the usual remedies.

682. FORBES, S. A. The chinch bug in 1882: Field notes. <Illinois Crop Prospects, 1 August, 1882, p. 77. <Farmers' Review, 19 October, 1882.

Brief notice of the unusual history of *Blissus leucopterus* in 1882, due to long-continued cool and rainy weather. Sundry experiments reported, including dissections of *Lasius flavus* and *Agonoderus comma* taken among chinch bugs. First mention of a supposed bacterial parasite of the chinch bug. Dilute kerosene emulsion found to be fatal to chinch bugs.

683. FORBES, S. A. The corn root-worm in McLean County. <Bloomington Leader, September, 1882.

Ravages of *Diabrotica longicornis*; rotation of crops a complete remedy.

684. FORBES, S. A. Bacterium a parasite of the chinch bug. <Amer. Nat., October, 1882, v. 16, p. 824-825. Abstract: <Prairie Farmer, 1882.

Abundance of *Bacterium termo*? in the alimentary canal of *Blissus leucopterus*.

- 684a. FORBES, S. A. Notes on weevils and other granary pests. <Farmers' Review, 1 December, 1882.

A short general discussion of the subject, called out by a correspondent, with suggestion of remedies.

685. FORBES, S. A. Another chinch bug parasite. <Prairie Farmer, 9 December, 1882.

1. Suggestion that white fungus on dead chinch bugs in Kansas may be identical with *Entomophthora* or *Empusa* which destroyed chinch bugs near Jacksonville, Ill. 2. Note of successful artificial cultures of *Bacterium* parasite of chinch bug, *Micrococcus insectorum*. 3. Recognition of the subject as of some promise, and one warranting careful investigation. 4. Reports development of only one brood of chinch bugs in Northern Illinois in 1882 which, in connection with their destruction by parasites or some unknown cause, makes unlikely any disastrous outbreak in that region in 1883.

686. FORBES, S. A. The corn root-worm (*Diabrotica longicornis*, Say). <Illinois crops for 1882, p. 122. <Prairie Farmer, 30 December, 1882, figs. <Cultivator and Country Gentl., 25 January, 1883. <Farmer and Fruit Grower, 24 January, 1883. <Farm and Fireside, 15 April, 1883.

Life history; character and amount of injury; remedy.

687. FORBES, S. A. The "cherry slug" (*Selandria cerasi*). <Prairie Farmer, 1882.

Report of serious damage by *Selandria* [= *Eriocampa*] *cerasi* in northern Illinois; describes the larva, and gives natural history, character of injury, and remedies.

688. FORBES, S. A. Report upon ornithology and entomology: Notes on economic ornithology. <Trans. Ill. State Hortic. Soc., 1882, n. s., v. 16, pp. 58-71.

Advantages of the joint study of ornithology and entomology; food of arboreal birds during spring and fall migrations, and in winter; summary for the year; notes on birds and canker worms.

689. FORBES, S. A. Contributions to Horticultural entomology. 1. The strawberry crown-borer (*Tyloderma fragariae* Riley). 2. The strawberry root-worm (*Paria aterrima* Haldeman). <Trans. Ill. State Hortic. Soc., 1882, n. s., v. 16, p. 199. Life histories of *Tyloderma fragariae* and *Paria aterrima* [= *Typophorus canellus*]; their injuries, enemies, preventives, and remedies.
690. FORBES, S. A. Insects affecting corn. <Prairie Farmer, 24 February, 1883. See: <Advance Farmer, July, 1883. Introduction to address read before a farmers' institute, giving objects, subject matter, and methods of economic entomology, as indicating the extent and intricacy of the subject, and mentioning observation, record, generalization, experiment, and verification, as the processes necessary to its mastery.
691. FORBES, S. A. A new wheat insect. The wheat bulb worm. <Illinois Crop Prospects, 1 April, 1883, p. 16. See: <Colman's Rural World, 24 May, 1883. <Farmers' Review, 7 June, 1883. <The Talk, 29 June, 1883. <Farm and Fireside, 15 May, 1883. <Pacific Rural Press, 12 May, 1883. <Amer. Nat., October, 1883, v. 17, p. 1073. Serious local damage by *Meromyza americana* reported from central and southern Illinois where it has been confounded with the Hessian fly. The larva is described and figured; its injuries to vegetation are characterized, and a few points in the life history of the species are given.
692. FORBES, S. A. Experiments on chinch-bugs. <Bull. No. 2, Div. Ent. U. S. Dept. Agric. [17 April], 1883, pp. 23-25. See Part 3, No. 2165, p. 302.
693. FORBES, S. A. The Strawberry crown borer (*Tyloderma fragariae* Riley). <Illinois Crop Prospects, 1 May, 1883, p. 42. Life history of *Tyloderma fragariae*; habits of larva; character and extent of its injuries; description of beetle, suggestion for its destruction, and recommendation for starting new plantations.
694. FORBES, S. A. [Note on *Lygus lineolaris*.] <Farmer and Fruit Grower, 23 May, 1883.
695. FORBES, S. A. A new corn insect. <Bloomington Pantagraph, 29 May, 1883.
696. FORBES, S. A. The regulative action of birds upon insect oscillations. <Bull. No. 6, Ill. State Lab. Nat. Hist., May, 1883, v. 1, pp. 3-32. See: <Bull. Nutt. Ornith. Club, April, 1883, v. 8, p. 105. <Amer. Nat., June, 1883, v. 17, p. 671. <Farm and Fireside, 1883: 15 July, 1 September. <Cultivator and Country Gentl., 1883, v. 49; 13, 27 September. <Gardener's Mo. and Hortic., 1883, v. 25, p. 62. Food habits of various species of birds when insects are unusually and excessively abundant, discussion, tables, and details.
697. FORBES, S. A. The food relations of the Carabidæ and Coccinellidæ. <Bull. No. 6, Ill. State Lab. Nat. Hist., May, 1883, v. 1, pp. 33-64. See: <Can. Ent., January, 1883, v. 15, p. 13.

697. FORBES, S. A.—Continued.

<Rept. Ent. Soc. Ont., 1883, p. 79. <Amer. Nat., April, 1883, v. 17, p. 419.

Discussion of the food of various species of Carabidæ and Coccinellidæ under general circumstances and under conditions relating to particularly injurious species; summary and discussion of the food of each family as a unit; tables showing food under ordinary circumstances, under peculiar conditions, and under all the circumstances taken together.

698. FORBES, S. A. The food of the smaller fresh-water fishes. <Bull. No. 6, Ill. State Lab. Nat. Hist., May, 1883, v. 1, pp. 65-94.

Summarization of observations on the food habits of some of the smaller fishes of Illinois; prevalence of limophagous habits.

699. FORBES, S. A. The striped blister-beetle. <Farmer and Fruit Grower, 13 June, 1883. See: <Ibid., 27 June, 1883.

Brief synopsis of life history of *Epicauta vittata*, with citation to Riley's account in American Naturalist (1878). Attention called to the service rendered by the larva in the destruction of grasshoppers' eggs.

700. FORBES, S. A. An enemy of wheat. The wheat bulb worm (Forbes), wheat-stem maggot (Lintner), *Meromyza americana* Fitch. <Prairie Farmer, 4 August, 1883.

Outline history of *Meromyza americana*; account of serious injury in 1889 in Fulton County, Ill., and of its occurrence throughout a large area in central and southern Illinois; different stages described and figured; life history given; injury characterized. A parasite (*Cælinius* sp.) said to be effective in limiting its increase. In case the *Meromyza* should ever become generally destructive, rotation of crops, late sowing of wheat, and prompt burning of straw after threshing are recommended.

701. FORBES, S. A. The zebra caterpillar (*Ceramica* [= *Mamestra*] *picta*). <Prairie Farmer, 11 August, 1883.

Larvæ reported as injurious to cabbages identified as *Ceramica* [= *Mamestra*] *picta*; quotes Riley and recommends pyrethrum as a remedy.

702. FORBES, S. A. A new insect disease. <Prairie Farmer, 6 October, 1883.

Destruction of *Pieris rapæ* by a disease similar to *flacherie* of the silk worm. Study of this disease in the cabbage worm and in *Datana* larvæ shows it to be bacterial, and experiments prove the disease contagious, and that it can be conveyed to healthy insects by artificial cultures.

703. FORBES, S. A. Memoranda with regard to the contagious diseases of caterpillars and the possibility of using the virus of the same for economic purposes. <Amer. Nat., November, 1883, v. 17, p. 1169. See: <Can. Ent., September, 1883, v. 15, p. 171.

Summary of studies concerning a *Micrococcus*, abundant in *Blissus leucopterus*.

704. FORBES, S. A. Entomological notes of the season. <Illinois Crops for 1883, Circ. No. 106, Ill. Dept. Agric., p. 177. Reprint: <Prairie Farmer, 8 December, 1883. <Chicago Evening Journ., 14 March, 1884. <Prairie Farmer, 22 March, 1884.

Summary of the season's work in economic entomology, including brief notes on injuries by the seed corn maggot, black-headed grass maggot, *Solenop-*

704. FORBES, S. A.—Continued.

sis fugax, corn plant-louse, species of plant-lice found on sorghum and broom corn, *Diabrotica longicornis*, Hessian fly, wheat straw worm, wheat bulb worm, rose-chafer, flea negro bug, forest tent-caterpillar, plum curculio, tarnished plant bug, and dusky plant bug. Note of the order of attack upon strawberry roots by the larvæ of *Colapsis brunnea*, *Paria aterrima* [= *Typophorus canellus*], *Scelodonta pubescens*, and of the occurrence of several wide-spread and destructive contagious diseases.

705. FORBES, S. A. Insects injurious to swine. <Prairie Farmer, 15 December, 1883.

Brief illustrated account of the most important Diptera, Hemiptera, and Arachnida which infest domestic animals; mode of their attack; description of hog louse; life history and nature of its injury; characteristics of disease produced by hog mite; description of the adult female; hints as to methods of destruction; short discussion of Entozoa infesting swine.

706. FORBES, S. A. On a contagious disease of caterpillars. <Trans. Ill. State Hortic. Soc., 1883, n. s., v. 17, pp. 29–41. See: <Farmers' Review, 27 December, 1883, p. 107.

Observations and experiments showing that the contagious diseases of insects may prove a means of defense against injurious insects.

707. FORBES, S. A. Insects affecting the strawberry. <Trans. Miss. Valley Hortic. Soc., for 1883, 1883, v. 1, pp. 50–85, figs. 1–22. See: <Prairie Farmer, 1883, 17 March, 7 April, 9 June. <Moore's Rural New Yorker, 31 March, 1883. <Trans. Wisc. State Hortic. Soc., 1883, p. 1.

Treats of *Emphytus* [= *Harpiphorus*] *maculatus*, *Osmia canadensis*, *Nemato-campa filamentaria*, *Angerona crocataria*, *Acronycta oblongata*, *Leucania unipuncta*, *Anchylopera* [= *Phoxopteris*] *fragaria*, *Exartema* [= *Eccopsis*] *permundana*, *Loxotania fragariæ* [= *Ptycholoma persicana*], *Colaspis flavida*, *Paria aterrima* [= *Typophorus canellus*], *P. sexnotata* [= *Typophorus canellus*], *Caloptenus spretus*, *Acridium americanum*, *Siphonophora fragariæ*, *Tettigoniid* sp., *Nysius destructor* [= *angustatus*], *Thyreocoris* [= *Corimelana*] *pulicaria*, *Anarsia lineatella*, *Otiorynchus sulcatus*, *Tyloderma fragariæ*, *Formicidæ*, *Lachnosterna* sp., and *Cotalpa lanigera*; their habits, characters, ravages, and means against them; general discussion; calendar of strawberry insects.

708. FORBES, S. A. Twelfth report of the State entomologist on the noxious and beneficial insects of the State of Illinois. First annual report of S. A. Forbes, for the year 1882. <Trans. Dept. Agric. State of Illinois for 1882, 1883, n. s., v. 12, 154+10 pp., 31 figs. Separate: <Springfield, Ill., 1883.

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709. FORBES, S. A. Birds in relation to agriculture. <Stoddart's Encyclopædia Americana, 1883, v. 1, pp. 131-134, figs. 1-6.

General remarks on the agricultural relations of birds; brief account of the food of a few of the more important species.

710. FORBES, S. A. The scale insect ["rose scale"]. <Cobden Sentinel, 14 February, 1884.

Answer to correspondent, who sends *Diaspis rosæ* from the raspberry; life history outlined; and economic recommendations made.

711. FORBES, S. A. The tarnished plant bug (*Lygus lineolaris* Beauv.). <Farmers' Review, 28 February, 1884. Reprint: <Ann. Rept. Minn. State Hortic. Soc., 1884, p. 339.

General description of *Lygus lineolaris*, with some account of its habits and life history, and of remedial measures.

712. FORBES, S. A. On the life histories and immature stages of three Eumolpini. <Psyche, February, 1884, v. 4, p. 123.

Treats of *Colaspis brunnea*, *Paria aterrima* [= *Typophorus canellus*] and *Scelodonta pubescens*† [= *nebulosus*].

713. FORBES, S. A. [Remedies for the cabbage worm.] <Alton Weekly Telegraph, 17 April, 1884. <Trans. Ill. State Hortic. Soc., 1884, v. 18, pp. 258-259.

Means against *Pieris rapæ*.

714. FORBES, S. A. Thirteenth report of the State Entomologist on the noxious and beneficial insects of the State of Illinois. Second annual report of S. A. Forbes, for the year 1883, <Trans. Dept. Agric. State of Illinois for 1883, 1884, v. 12, 203 + 21. pp., pl. 1-15. Separate: <Springfield, Ill., April, 1884, 203 + 21 pp., pl. 1-15.

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715. FORBES, S. A. Plant lice. <Prairie Farmer, 3 May, 1884.
Answer to correspondent, who sends plant-lice eggs for identification; mentions remedies applicable to the situation in which they were found.
716. FORBES, S. A. [Saw-flies. *Dolerus arvensis* and *D. bicolor*.]
<Western Rural, 17 May, 1884.
Observation of, and dissections, do not justify charges against *Dolerus arvensis* and *D. bicolor* as injurious to fruit.
717. FORBES, S. A. [The plum curculio and cherries.] <Farmers' Review, 29 May, 1884.
Reply to an editorial inquiry as to what insect is injuring cherries.
718. FORBES, S. A. On the life histories and immature stages of three Eumolpini. Corrective notes. <Psyche, May, 1884, v. 4, pp. 167-168.
Scelodonta pubescens of a previous paper (No. 712) is *S. nebulosus*.
719. FORBES, S. A. Circular [on corn root aphid and Hessian fly].
<Illinois Crop Prospects, May, 1884, p. 48. Reprint:
<Farmers' Review, 5 June, 1884. See: <Prairie Farmer, 14 June, 1884.
A request for information concerning injuries by *Aphis maidis* on ground not in corn the preceding year, and for alcoholic specimens of this aphid found on any other plant than corn; examples of *Cecidomyia destructor* solicited as an aid to the more precise determination of its life history; and serious underground injuries to corn and sorghum briefly characterized, though neither injury is definitely connected with insect attack.
720. FORBES, S. A. The wheat-straw worm. <Illinois Crop Prospects, 1 June, 1884, p. 14. Reprint: <Farmers' Review, 10 July, 1884.
An illustrated general article on *Isosoma tritici*, giving extent and character of injury, and life history, and proposing remedies.
721. FORBES, S. A. [Reply to] "Questions about the corn root-worm."
<Prairie Farmer, 7 June, 1884.
To a correspondent who wants to know if salt will kill the "worms" injuring his corn—presumably *Diabrotica longicornis*—Prof. Forbes replies that he does not know of its having been tried, and mentions some mineral fertilizers as more likely to take effect. Change of crop for a single year said to exterminate the insect.
722. FORBES, S. A. [Investigating grain insects. The Hessian fly.]
<Prairie Farmer, 7 June, 1884.
Paragraph from a letter concerning plans inaugurated for completing the life history of the Hessian fly in the Wabash Valley.
723. FORBES, S. A. The insect dispute. <Farmer and Fruit Grower, 18 June, 1884.
Editorial caption to a letter of Prof. Forbes, acknowledging receipt of package of strawberry leaves and crown borers. Leaves said to be badly affected with rust. Editor refers to correspondents' debate as to whether the strawberry is suffering from insect or fungus attack.
724. FORBES, S. A. What ails the larch? <Prairie Farmer, 11 October, 1884. Reprint: <Trans. Ill. State Hort. Soc., 1884, n. s., v. 18, pp. 420-421.
Injuries of red spiders [= *Tetranychus telarius*].

725. FORBES, S. A. The grass worm, or fall army worm (*Laphygma frugiperda* Guen.). <Circular [Office of State Entomologist], 14 October, 1884. Reprint: <Prairie Farmer, 25 October, 1884. See: <Farmers' Review, 30 October, 1884.

Account of extensive damage to winter wheat in Tazewell, Mason, and Fulton counties, Ill., where hundreds of acres have been completely devoured by *Laphygma frugiperda* and resowed, the circular being designed to prepare farmers to take prompt measures against a second brood should it appear. Previous history; short description of its stages; life history; food habits; and remedies likely to be successful (mechanical destruction and poisoning); and a recommendation that wheat be not sown on oats ground the following year unless special care is taken to keep down volunteer oats previous to its sowing.

726. FORBES, S. A. A season's work in horticultural entomology. <Trans. Ill. State Hortic. Soc., 1884, n. s., v. 18, pp. 117-127. See: <Prairie Farmer, 20 December, 1884.

Notes on the habits and ravages of *Emphytus* [= *Harpiphorus*] *maculatus*, *Selandria* [= *Eriocampa*] *cerasi*, *Sphinx* [= *Ceratonia*] *catalpæ*, *Halisidota tessellata*, *Mamestra picta*, *Pempelia hammondi*, *Cacæcia rosaceana*, *Teras malivorana*, *Drosophila ampelophila*, *Paria aterrima* [= *Typophorus canellus*], *Scelodonta pubescens*, *Siphonophora minor*, *Diaspis rosæ*, and *Pulvinaria innumerabilis*.

727. FORBES, S. A. Supplementary report on insects affecting the strawberry. <Trans. Miss. Valley Hortic. Soc. for the year 1884, 1884, v. 2, pp. 234-258.

Treats of *Selandria* [= *Monostegia*] *rosæ*, *Cymatophora pampinaria*, *Phyllotreta vittata*, *Crepidodera* [= *Epitrix*] *fuscata*, *Systema blanda*, *Paria aterrima* [= *Typophorus canellus*], *Scelodonta nebulosa*, *Colaspis brunnea*, *C. tristis*, *Cacæcia rosaceana*, *C. obsoletana*, *Pulvinaria innumerabilis*, *Siphonophora minor*, *Tetranychus telarius*, *Solenopsis fugax*, *Anthonomus musculus* [= *signatus*], *Lygus lineolaris* [= *pratensis*], *Deræcoris rapidus*, *Cambala annulata*, *Allorhina nitida*, and *Otiorynchus sulcatus*; calendar of strawberry insects, classification of insect injuries with suggestions as to remedies, classification of remedial measures; modes of culture; barriers to progress; capture and direct destruction; topical application.

728. FORBES, S. A. *Æcanthus niveus*. <Farmers' Review, 16 April, 1885.

Eggs deposited in grape twigs identified as those of *Æcanthus niveus*; correspondent referred to literature of the species; remedial measures indicated, and attention called to the fact that the insect is to some extent insectivorous.

729. FORBES, S. A. The root web-worm (*Crambus zeellus* Fernald). <Illinois Crop Report, May, 1885, p. 38, fig. See: <Western Rural, 20 June, 1885.

Injuries to young corn in May and June; description of larva and imago; habits of larva; figures larva.

730. FORBES, S. A. Note on *Murgantia histrionica*. <Home and Farm, 15 June, 1885.

731. FORBES, S. A. Further notes on the root web-worm. <Statistical Rept. Ill. State Board Agric., June, 1885, p. 48, figs. Reprint: <Farmers' Review, 8 July, 1885. See: <Prairie Farmer, 11 July, 1885. <Farmers' Review, 11 June, 1885.

Ravages of and means against *Crambus zeellus*.

732. FORBES, S. A. [Coccinellid enemies of the maple bark-louse.] <Farmers' Review, 22 July, 1885.
Letter to the editor confirming his opinion that the ravages of *Pulvinaria innumerabilis* are being checked by natural enemies (*Chilocorus bivulnerus* and *Hyperaspis signata*) which destroy its eggs.
733. FORBES, S. A.. [*Selandria cerasi*.] <Farmers' Review, 22 July, 1885.
Recommends white hellebore and pyrethrum and outlines history.
734. FORBES, S. A. On some Illinois locusts (grasshoppers). <Statistical Rept. Ill. State Board Agric., August, 1885, p. 27.
Report of an extraordinary outbreak of *Pezotettix* [= *Caloptenus*] *femurrubrum* and *P.* [= *C.*] *differentialis* in Illinois in 1885; brief description of the species, their life histories and habits, and of their injuries to vegetation during the season; an account of the climatic conditions to which the outbreak is probably due, of the natural influences and enemies tending to limit and suppress it, and of remedies.
735. FORBES, S. A. A new species of *Crambus* injuring corn roots. <Amer. Nat., September, 1885, v. 19, pp. 891-892.
Relates to *Crambus zeellus*. Advance print from 14th Rept. State Entomologist of Illinois. See No. 737.
736. FORBES, S. A. Experiments on the Codling moth and Curculios (*Carpocapsa pomonella* Linn.; *Anthonomus quadrigibbus* Say; *Conotrachelus nenuphar* Herbst.). <Trans. Ill. State Hortic. Soc., for 1885, 1885, new ser., v. 19, pp. 103-119. See: <Prairie Farmer, 19 December, 1885.
Details of experiments with Paris green, London purple, and lime; cost of experiments; damage to trees; dangers to stock and to health; natural history of the codling moth.
737. FORBES, S. A. Fourteenth report of the State Entomologist on the noxious and beneficial insects of the State of Illinois. Third annual report of S. A. Forbes for the year 1884. <Trans. Dept. Agric. State of Illinois for 1884, 1885, v. 21, 7+136+19+120 pp., pl. 1-12, 1 fig. Separate: <Springfield, Ill., 1885, 7+136+19+120 pp., pl. 1-12, 1 fig.

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738. FORBES, S. A. [Notes on the lesser apple leaf-roller and the green apple leaf-hopper.] <Trans. Ill. State Hortic. Soc., 1885, new ser., v. 19, p. 133.

Injuries and means against.

739. FORBES, S. A. [The plum curculio.] <Circular [Office of State Entomologist], 27 April, 1886. Reprint: <Prairie Farmer.

In view of the serious ravages of this insect in apple orchards, persons having plum and apple trees in close proximity are asked to report, that opportunity may be afforded to test the feasibility of protecting the apple orchard by planting plum trees around it to serve as lures.

740. FORBES, S. A. Chinch bugs in Illinois. <Prairie Farmer, 31 July, 1886.

Summary of life history, with economic recommendations.

741. FORBES, S. A. Studies on the contagious diseases of Insects. <Bull. Ill. State Lab. Nat. Hist., August, 1886, v. 2, pp. 257-321, pl. 1.

Results of studies on bacterial diseases of *Pieris rapæ*, *Datana* sp., *Mamestra picta*, *Bombyx* [= *Sericaria*] *mori*, and of an epidemic of muscardine in *Clisiocampa sylvatica* [= *disstria*.]

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In view of the severe losses in southern Illinois in 1886 from chinch-bug injury and drouth, the situation is discussed at length. Extent of infested area; relative damage to various crops; life history of the species in southern Illinois; food plants, natural checks; probabilities of continued damage; prevention and remedies, and concerted action.

743. FORBES, S. A. Notes on the past year's work. <Can. Ent., September, 1886, v. 18, p. 176. <Ent. Amer., December, 1886, v. 2, p. 173.

Notes on the habits or ravages of *Cecidomyia destructor*, *C. leguminicola*, *Meromyza americana*, several Elaterids, *Diabrotica longicornis*, *Systema blanda*, *Epicarus imbricatus*, *Sphenophorus parvulus*, *Aphis maidis*, *Nematus ventricosus* [= *ribesii*], and *Crambus zeellus*.

744. FORBES, S. A. A contagious disease of the European cabbage worm, *Pieris rapæ*, and its economic application. <Proc. 7th Ann. Meeting for Prom. of Agric. Sci., 1886, p. 26.

Remarks on diseases of the lower animals; practicability of utilizing these natural checks on insect multiplication by artificial manipulation; brief classification of contagious insect diseases; symptoms of the disease of *Pieris rapæ*; micrococci of the fluids of diseased larvæ; contagious character of the disease; its irregular local distribution; culture and infection experiments.

745. FORBES, S. A. Miscellaneous essays on economic entomology by the State entomologist and his entomological assistants. <Trans. Dept. Agric. State of Illinois for 1885, 1886, v. 23, pp. 5-130. Separate: <Springfield, Ill., 1886, 130 pp.

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Extract from a lecture before a farmers' institute. Number of species known to infest corn; prospects for the future; two classes of corn insects; reasons for increase in recent times; prevention and remedy.

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748. FORBES, S. A. [Tipulidæ.] <Circular [Office of State Entomologist], 28 April, 1887. Reprint: <Prairie Farmer, 7 May, 1887.

Extensive and serious injury to meadows and pastures in southern Illinois, apparently due to crane-fly larvæ; describes the injury and requests information concerning its extent and amount.

749. FORBES, S. A. A new enemy to grasses. <Prairie Farmer, 14 May, 1887.

Injury to meadows and pastures, grass, and clover, in central Illinois, due to a tipulid larvæ, with a request for observation and report from those who detect this injury on their farms.

750. FORBES, S. A. Arsenical poisons for the codling moth (*Carpocapsa pomonella* Linn.). Record and discussion of experiments for 1885 and 1886. <Bull. No. 1, Office of State Entomologist Illinois, 1887. <Trans. Ill. State Hortic. Soc. for 1886, 1887, new ser., v. 20, pp. 109-118. See: <Amer. Nat., May, 1887, v. 21, p. 480. <Farmers' Review, 4 May, 1887. <Trans. Wisc. State Hortic. Soc., 1887, p. 103. <Trans. Maine State Pomol. Soc., 1886, p. 160. <Prairie Farmer, 30 April, 1887.

Demonstration that at least 70 per cent of the loss occasioned by the codling moth may be prevented by the use of paris green in a spray with water.

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Eggs of *Aphis maidis* in nests of *Lasius alienus*.

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Letter to the Secretary of the State Department of Agriculture, outlining the imminent danger of an outbreak of *Blissus leucopterus* in northern Illinois in 1888 and noting the adaption of the present weather in central Illinois to its development.

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864. GAYLORD, W.—Continued.

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Horse bots, *Gasterophilus equi*, *G. hæmorrhoidalis*, *G. veterinus* [= *nasalis*], Sheep bot, *Æstrus ovis*, Sheep tick, *Hippobosca* [= *Melophagus*] *ovinus*, Sheep fly, *Musca carnaria* [= ? *Sarcophaga similis*], Ox or gad fly, (*Æstrus* [= *Hypoderma*] *bovis*, Lice, Pediculi, Bee louse, *Braula cæca*, Bee moth, *Tinea cerella* [= *Galleria cereana*).

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* Townend Glover was born at Rio de Janeiro, 20th of February, 1813, and died in Baltimore, Md., 7th of September, 1883. <See Bull. No. 18, U. S. Dept. Agric., Div. Ent., 1888.

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904. GLOVER, T. Report of the entomologist and curator of the museum. <Rept. [U. S.] Comm. Agric. for 1870, 1871, pp. 65-91, 60 figs.
The following species are treated chiefly from an economic point of view: *Tetracha virginica*, *Aleochara anthomyia* [= *nitida*], *Trogosita* [= *Tenebroides*] *dubia*, *T.* [= *T.*] *mauritanica*, *Silvanus surinamensis*, *Sitodrepa panicea*, *Platycerus quercus*, *Chrysobothris femorata*, *Dicerca divaricata*, *Oberea tripunctata*, *Agrilus ruficollis*, *A. egenus*, *Agriotes mancus*, *Epicauta corvina*, *Scolytus caryæ* [= *4-spinosus*], *Sphenophorus cariosus*, *S. zææ* [= *sculptilis*], *Phytobius* sp.?, *Conotrachelus nenuphar*, *Cæliodes* [= *Craponius*] *inæqualis*, *Balaninus nasicus*, *B. rectus*, *Anthonomus quadrigibbus*, *A. suturalis*, *A. prunicida* [= *Coccotorus scutellaris*], *Lixus concavus*, *Epicærus* [= *Graphorhinus*] *vadosus*, *E. imbricatus*, *Caryoborus arthriticus*, *Bruchus pisi*, *B. granarius*, *B. varicornis* [= *fabæ*] *B. sinuatus*, *B. obsoletus*, *Prionus imbricornis*, *P. brevicornis* [= *laticollis*], *P. laticollis*, *Egeria* [= *Sciapteron*] *polistiformis*, *Clytus pictus* [= *Cyllene robinæ*], *Heliomanes* [= *Molorchus*] *bimaculatus*, *Tessaropa* [= *Dysphaga*] *tenuipes*, *Liopus xanthoxyli* [= *fascicularis*], *Galeruca californiensis* [= *xanthomelæna*], *Diabrotica vittata*, *Graptodera* [= *Haltica*] *chalybea*, *Doryphora 10-lineata*, *D. juncta*, *Caloptenus spretus*, *C. femur-rubrum*, *Ectobia germanica*, *Nematus ventricosus* [= *ribesii*], *Pristiphora grossulariæ*, *Selandria* [= *Eriocampa*] *cerasi*, *Eumenes fraterna*, *Pieris rapæ*, *P. oleracea*, *P. protodice*, *Macrosila* [= *Protoparce*] *celeus*, *Sphinx eremitus*, *Utetheisa bella*, *Acolothus falsarius*, *A.* [= *Harrisina*] *americana*, *Attacus cynthia*, *A. pernyi*, *A. yama-mai*, *Bombyx* [= *Sericaria*] *mori*, *Anisota* [= *Dryocampa*] *senatoria*, *A.* [= *D.*] *rubicunda*, *Clisiocampa americana*, *Leucania unipuncta*, *Heliothis armiger*, *Phakellura* [= *Eudiotis*] *nitidalis*, *Asopia costalis*, *Anisopteryx* [= *Paleacrita*] *vernata*, *Anchylopera* [= *Rhopobota*] *vacciniana*, *Lobesia* [= *Eudemis*] *botrana*, *Carpocapsa pomonella*, *Pemphigus pyri* [= *Schizoneura lanigera*] *Phylloxera vastatrix*, *Aspidiotus conchiformis*, [= *Mytilaspis pomorum*], *Micropus* [= *Blissus*] *leucopterus*, *Coreus* [= *Anasa*] *tristis*, and *Strachia* [= *Murgantia*] *histrionica*; many of the species are figured; notes on insectivorous birds.

905. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [January], 1872, pp. 22-24, figs. 1-3.
Ravages of *Ædipoda* [= *Camnala*] *atrox*; figure *C. atrox*, *Caloptenus spretus*, *C. femur-rubrum*; means against *Diabrotica vittata*; *Epicauta marginata* [= *cinerea*] injurious to eggplants.
906. GLOVER, T. The Utah cricket. <Monthly Rept. [U. S.] Dept. Agric. for [February], 1872, pp. 74-76, fig. 4.
Characters of *Anabrus simplex*; figures ♀; habits, ravages, and means against the species.
907. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [March and April], 1872, p. 137, fig. 5.
Characters and figures of *Cerostoma brassicella* [= *Plutella cruciferarum*]; its ravages and means against it; enemies and parasites.
908. GLOVER, T. A new grasshopper. <Monthly Rept. [U. S.] Dept. Agric. for [May and June], 1872, pp. 215-218, fig.
Injuries of *Copiophora mucronata* and *Doryphora 10-lineata*; *Pieris rapæ* in D. C. in June, 1872.
909. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [July], 1872, pp. 304-307, fig. 10.
The characters, habits, ravages, and remedies of *Anarsia pruinella* [= *lineatella*]; mites on pear leaves; notes on *Doryphora 10-lineata*, cut worms, Cicadæ, aphides, various larvæ, *Caloptenus* sp., army-worms, chinch-bugs, etc.
910. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [August and September], 1872, pp. 366-369.
Injuries of *Aræocerus coffeæ* [= *fasciculatus*] in decaying peaches; figures larva and adult; figures larva, pupa, and adult of *Mycetobia* [= *Mycetophila*] *persicæ*; habits of the species; brief notes on insect injuries reported from various localities.
911. [GLOVER, T.] Twig girdlers. <Cultivator and Country Gentl., 5 September, 1872, v. 37, p. 567.
Characters and habits of *Elaphidion villosum*.
912. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [October], 1872, pp. 438-440.
Habits, characters, and figures of *Sciara* sp.; notes on the losses caused by various insects.
913. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [November and December], 1872, pp. 497-499.
914. GLOVER, T. Report of the entomologist and curator of the museum. <Rept. [U. S.] Comm. Agric. for 1871, 1872, pp. 69-88, 23 figs.
Estimates of damage done by insects; habits, characters, ravages, and means against *Oncideres cingulata*, *Elaphidion villosum*, *Anthonomus signatus* and *Doryphora 10-lineata*; figures the same; means against *Conotrachelus nenuphar*; characters and ravages of *Ædipoda* [= *Camnula*] *atrox*; figures *O. [= C.] atrox*, *Caloptenus spretus*, *C. femur-rubrum*; describes and figures *Anabrus simplex* and *Copiophora mucronata*; their characters, habits, and ravages; description and figures of *Plutella xylostella* [= *cruciferarum*];*

* See Gardener's Monthly, August, 1872, v. 14, n. s., v. 5, pp. 250-251.

914. GLOVER, T.—Continued.

its habits, ravages, and means against them; means against *Anomis* [= *Aletia*] *xylina*; habits and means against *Strachia* [= *Murgantia*] *histrionica* (figure); characters, habits, ravages, and means against *Erythro-neura* [= *Typhlocyba*] *vitis* (figure); food habits, description, and figures of *Thrips* sp. on grape; figures *Phylloxera vastatrix*; its habits, ravages, and remedies; brief notes relating to *Doryphora juncta* (figure), *Lema trilineata* (figure), *Epicauta vittata* (figure), *E. lemniscata*, *E. marginata* [= *cinerea*] (figure), *Diabrotica vittata* (figure), *Udeopsylla robusta*, *Pieris rapæ* (figure), *Priocyda* [= *Eudropia*] *armataria*, *Heliothis armiger*, *Leucania unipuncta*, and *Rhyparochromus* [= *Blissus*] *leucopterus*, figure.

915. GLOVER, T. Illustrations of North American Entomology [United States and Canada]. Orthoptera. <Washington, D. C., 1872, 5 + 10 pp., 13 plates, with a page of explanatory text to each plate.

CONTENTS: Introduction, iii; arrangement of families, v; plates, notes on food and habits of Orthoptera, 1; parasites, 2; list of substances injured by Orthoptera, 5; list of genera figured, 7; list of species figured, 9; list of desiderata and errata, 11.

916. GLOVER, T. A vindication of the entomological division of the U. S. Department of Agriculture. <1872, 6 pp.

A reply to statements made in "The Department of Agriculture, its history and objects."

917. GLOVER, T. Entomological record. <Monthly Rept. [U.S.] Dept. Agric. for [January], 1873, pp. 29–31.

Characters, habits, and means against *Amphicerus bicaudatus*; notes on snake worm [= *Sciara* sp.]; unleached oak ashes as a means against *Macroductylus subspinosus*; insects injurious to plums.

918. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [April], 1873, pp. 164–166, figs. 3–6.

Natural history with figures of *Macrosila* [= *Protoparce*] *carolina*; its ravages, habits, remedies, and enemies.

919. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [May and June], 1873, pp. 237–238.

Notes on *Oncideres cingulata*, *Doryphora 10-lineata*, and *Amphicerus bicaudatus*; notes on the losses caused by insects.

920. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [July], 1873, pp. 345–351, figs. 1–3.

Notes on *Systema blanda*, *Doryphora 10-lineata*, *Phylloxera vastatrix*, trap-door spider and a luminous larva; mention of the losses caused by various insects.

921. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [August and September], 1873, pp. 426–431.

Notes on *Doryphora 10-lineata*, Paris green, *Phylloxera vastatrix* and on the losses caused by various insects.

922. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [October], 1873, pp. 496–497.

Injuries of *Ægeria* [= *Sciapteron*] *polistiformis*; remedy; notes on the losses caused by various insects.

923. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [November and December], 1873, pp. 571-579, fig.

Means against cotton insects; notes on *Phylloxera vastatrix* *Doryphora 10-lineata*, *Xyloryctes satyrus*, and on the losses caused by insects.

924. GLOVER, T. Report of the entomologist and curator of the museum. <Rept. [U. S.] Comm. Agric. for 1872, 1873, pp. 112-138, 26 figs.

Ravages and means against *Anarsia pruinella* [= *lineatella*] (figure), *Typhlodromus pyri* (figure), *Romalea microptera* [= *Dictyophorus reticulatus*] (figures), *Amphicerus bicaudatus* (figure); food-habits of *Aræocerus coffeæ* [= *fasciculatus*] (figure), *Mycetophila persicæ* (figure), *Sciara* sp. (figure); distribution, enemies, and means against *Doryphora 10-lineata*; appearance and ravages of *Cicada* [= *Tibicen*] *septendecim*; means against *Macroductylus subspinosus* and insects injurious to plum trees; ravages of *Anomis* [= *Aletia*] *xylina*, *Heliothis armiger*, *Prodenia autumnalis* [= *Laphygma frugiperda*], cantharides [Meloidæ], *Micropus* [= *Blissus*] *leucopterus*, *Cecidomyia destructor*, *Caloptenus spretus*, *C. femur-rubrum*, cut-worms [Agrotidæ], *Lachnosterna* sp., *Leucania unipuncta*, *Bruchus pisi*, *Macrosila* [= *Protoparce*] *carolina*, *Phorodon humuli*, cabbage worms, canker-worms, *Paleacrita vernata* and *Anisopteryx pometaria*; habits of Diptera; habits and means against mosquitoes, Culicidæ, (figure), *Cecidomyia destructor* (figure), *Diplosis destructor* [= *tritici*], figure, *Cecidomyia grossulariæ*, *C.* [= *Diplosis*] *robinia*, *Tipula oleracea*, figure, *T. maculosa*, *Trichocera hiemalis*, (figure), *Simulium* sp., *Tabanus atratus* (figure), *Chrysops* sp., (figure), *Æstrus ovis*, (figure), *O.* [= *Hypoderma*] *bovis*, (figure), *Gastrophilus equi*, *Musca* sp., *Stomoxys calcitrans* (figure), *Sarcophaga carnaria*, *Calliphora vomitoria*, (figure), *Lucilia cæsar*, (figure), *Anthomyia ceparum*, (figure), *Psila rosæ* (figure), *Ortalis* [= *Tritoxa*] *flexa*, (figure), *Chlorops* sp., *Agromyza tritici*, *Hippobosca equina* (figure), *Melophagus ovinus* (figure), Pulicidæ, and *Sarcopsylla penetrans*; means against noxious insects.

925. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [January], 1874, pp. 43-46.

Notes on *Phylloxera vastatrix*, Paris green, *Anomis* [= *Aletia*] *xylina*, and of the losses caused by insects.

926. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [April and May], 1874, pp. 221-222.

927. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [July], 1874, pp. 324-330.

928. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [August and September], 1874, pp. 373-376.

929. GLOVER, T. Entomological record. <Monthly Rept. [U. S.] Dept. Agric. for [October], 1874, pp. 428-431.

930. GLOVER, T. The grape-root gall-louse. <Monthly Rept. [U. S.] Dept. Agric. for [November and December], 1874, pp. 506-507.

931. GLOVER, T. Report of the entomologist and curator of the museum. <Rept. [U. S.] Comm. Agric. for 1873, 1874, pp. 152-169, 10 figs.

Food habits and means against *Systema blanda* (figure), and *Xyloryctes satyrus* (figure); describes larva of *X. satyrus*; habits of *Oncideres cingulatus*; dis-

931. GLOVER, T.—Continued.

tribution and means against *Doryphora 10-lineata*; comparative account of the habits and luminosity of *Pyrophorus physoderus* (figure), *P. noctilucus* (figure), and *Photinus pyralis*; ravages of *Caloptenus* sp.; *Phytolacca decandra* as a means against roaches [Blattidæ]; habits, transformations, parasites, enemies, and means against *Macrosila* [= *Protoparce*] *carolina*, (figures); comparison between it and *M. 5-maculata* [= *P. celeus*], (figure); ravages of *Egeria* [= *Sciapteron*] *polistiformis*; means against *Phylloxera vastatrix*; notes on a luminous larva [= *Phengodes* sp.]; comparative characters of *Anomis* [= *Aletia*] *xylina* and *Heliothis armiger*; Paris green as a remedy against *A. xylina*.

932. GLOVER, T. Manuscript notes from my journal or illustrations of insects native and foreign. Diptera or two-winged flies. <Washington, D. C., 1874, 4to, 3 + 120 pp., 13 plates.

CONTENTS: Introduction, i-iii; figures of about 340 imagoes, 160 young, 30 habitations, and numerous details of about 400 species, Pl. i-xii; anatomical details of 86 genera, Pl. A; arrangement of families, 1; alphabetical list of the families, and genera mentioned in this work, with synonyms, habitat, food, etc., 2-59; alphabetical list of predaceous or parasitic Diptera, the larvæ or perfect flies of which destroy other insects, 60-62; alphabetical list of vegetable and animal substances, etc., inhabited, injured, or destroyed by Diptera, 63-78; alphabetical list of insects of other orders either destroying Diptera or destroyed by them, 79-85; alphabetical list of authors, and of authorities quoted, 86-89; abbreviations, 90; alphabetical list of some of the genera, etc., of Diptera, with derivation of names, 91-93; alphabetical list of Diptera, and other orders, fungi, etc., with derivations of names, 94-100; supplement, remedies, 101-111; alphabetical lists of insects, etc., mentioned in report on remedies, 112; synoptic tables of divisions and families, 113-118; definition of terms, 118; addenda, 119-120; notes, 120.

933. GLOVER, T. Recent notes on the Phylloxera from foreign sources. <Monthly Rept. U. S. Dept. Agric. for [January], 1875, p. 40. Reprint: <Can. Ent., February, 1875, v. 7, pp. 35-39.

Results of experiments against *Phylloxera vastatrix*.

934. GLOVER, T. On beneficial insects. <Monthly Rept. U. S. Dept. Agric. for [April], 1875, pp. 175-176, fig.

Characters and figures of *Prionotus* [= *Prionidus*] *cristatus*; habits.

935. GLOVER, T. Entomological record. <Monthly Rept. U. S. Dept. Agric. for [May and June], 1875, pp. 221-230, figs. 1-6.

Treats of cut-worms; their habits, characters, enemies, and remedies; notes on *Phylloxera vastatrix* and on the losses caused by various insects.

936. GLOVER, T. Entomological record. <Monthly Rept. U. S. Dept. Agric. for [July], 1875, pp. 307-310.

Notes on the losses caused by various insects.

937. GLOVER, T. Insect injuries. <Monthly Rept. U. S. Dept. Agric. for [August and September], 1875, pp. 367-370.

Notes on the losses caused by various insects.

938. GLOVER, T. Entomological record. <Monthly Rept. U. S. Dept. Agric. for [October], 1875, pp. 442-445.

Natural history, habits, and ravages of *Micropus* [= *Blissus leucopterus*] its enemies and parasites; means against it and against *Doryphora 10-lineata*.

939. GLOVER, T. Report of the entomologist and curator of the museum. <Rept. [U. S.] Comm. Agric. for 1874, 1875, pp. 122-146, 20 figs.

Notes on the injuries of insects during the past year referring especially to the ravages of *Doryphora 10-lineata*, *Caloptenus spretus*, *Micropus* [= *Blissus*] *leucopterus*, and *Aletia xyliana*. General account with figures of characteristic species of Orthoptera, Thripidae, Thysanura, and Mallophaga.

940. GLOVER, T. Insect injuries. <Monthly Rept. [U. S.] Dept. Agric. for [July], 1876, pp. 245-246.

Notes on the losses caused by various insects.

941. GLOVER, T. Insect injuries. <Monthly Rept. [U. S.] Dept. Agric. for [August and September], 1876, pp. 333-336.

Notes on the losses caused by various insects.

942. GLOVER, T. Manuscript notes from my journal, or illustrations of insects, native and foreign. Order Hemiptera, suborder Heteroptera, or plant bugs. <Washington, D. C., 1876, 4to, 2+2+10+133 pp., 10 plates.

CONTENTS: Introduction, 1-2; about 325 figures of about 257 imagoes, 19 young and numerous anatomical details of about 240 species; arrangement of families, Burmeister's (1835), 16; Westwood's (1840), 16; Amyot and Serville's (1843), 16; Douglas and Scott's (1861-1865), 17; alphabetical list of families and genera, with synonyms, habits, food, habitat, 18-73; alphabetical list of predaceous or parasitic species, the larvæ, pupæ, or imagoes of which destroy other insects, 74-75; alphabetical list of vegetable and animal substances frequented, injured, or destroyed by Heteroptera, 76-85; alphabetical list of insects of other orders, destroyed by or destroying Heteroptera, 86-87; alphabetical list of authors, authorities, societies, etc., referred to, 88-91; abbreviations, 92; remedies, 93-96; alphabetical list of sections, families, and genera, 97-112; alphabetical list of species, 112-118; genera as arranged in the museum of the U. S. Department of Agriculture, 119-123; extract from Uhler's List of Hemiptera west of the Mississippi, 124-127; notes on habits, changes in nomenclature, position, and classification of the families, subfamilies, genera, and species, 128-131; errata and addenda, 132; recipients of this work, 132.

943. GLOVER, T. Report of the entomologist. <Rept. [U. S.] Comm. Agric. for 1875, 1876, pp. 114-140, 63 figs.

Characters of the Hemiptera Heteroptera; describes and figures some of the more prominent species of the suborder; their habits, ravages, and remedies.

944. GLOVER, T. Report of the entomologist and curator of the museum. <Rept. [U. S.] Comm. Agric. for 1876, 1877, pp. 17-46, 59 figs.

Report of Charles R. Dodge on the agricultural exhibit at the International Exhibition in Philadelphia; characters of the Hemiptera Homoptera; describes and figures some of the more important species of the group; their habits, ravages, and means against them.

945. GLOVER, T. Manuscript notes from my journal or entomological index, to names, etc., in agricultural reports, with list of vegetable and animal substances injured or destroyed by

945. GLOVER, T.—Continued.

insects, etc. <Washington, D. C., 1877, 4to, pp. 79 *bis* + pp. 81–103.

CONTENTS: Entomological index to the agricultural reports, 1–77; insects to a greater or less degree beneficial by destroying noxious insects, 78–79 *bis*; other agencies useful in the destruction of insects, 79 *bis*; substances injured or destroyed by insects, articles on cotton and cotton insects, 81–101; addenda and errata, 102–103.

946. GLOVER, T. Report of the entomologist and curator of the museum. <Rept. [U. S.] Comm. Agric. for 1877, 1878, pp. 89–148, 7 plates.

Descriptions and figures of some of the more important species of Hymenoptera; their characters, habits, injuries, and means against them; report of the museum division.

947. GLOVER, T. Manuscript notes from my journal.—Cotton, and the principal insects, etc., frequenting or injuring the plant in the United States. <Washington, D. C., 1878, 2 pp., 22 plates.

CONTENTS: Introductory; articles relating to cotton in the reports of the U. S. Department of Agriculture, 1–2; seeds and young plants, pl. 1; rot and disease commonly known as sooty-blossom, pl. 2; rust of the leaf, as caused by fungus or by *Acarus* sp., pl. 3; rust more developed, pl. 4; blight, pl. 5; Aphis, pl. 6; Plusia, 2 sp., Boarmia, pl. 7; Hyperchiria, pl. 8; Lozotænia [= *Cacæcia*] *rosaceana*, *Laphygma macra* [= *frugiperda*] pl. 9; *Aletia argillacea* [= *xylina*], pl. 10; *Lozotænia gossypiana* [*Cacæcia rosaceana*], *Antho-*
coris [= *Triphleps*] *insidiosus*, *Centrinus perscitus*, *Calocoris rapidus*, *C. bipunctatus*, pl. 11; young flower bud, young boll, bud in its involucre, pl. 12; flower open first day: *Epicauta strigosa*, *E. vittata*, *E. ferruginea*, *Chauliognathus americanus*, *C. marginatus*, pl. 13; young involucres shed in consequence of non-impregnation caused by wet weather, pl. 14; flower and young boll on second and third day: *Euryomia* [= *Euphoria*] *melancholica*, *E. sepulchralis*, *Trigonopeltastes* [= *Trichius*] *delta*, *Podisus spinosus*, *Conotelus obscurus*, pl. 15; young bolls: *Leptoglossus phyllopus*, *Euschistus punctipes* [= *variolarius*], *Nezara pennsylvanica*, *Largus succinctus*, pl. 16; flower: *Heliothis armiger*, pl. 17; boll: *H. armiger*, pl. 18; *Dysdercus suturellus*, pl. 19; rotted bolls: *Colastus semitectus*, *Homalota* sp., *Carpophilus hemipterus*, *Silvanus quadricollis*, attacking maize, fungoid growth on maize, pl. 20; rusted bolls: *Tinea granella* ? in maize also, pl. 21; healthy boll and partially rusted boll, pl. 22.

948. GODFREY, A. N. Report. <First Rept. U. S. Ent. Comm., 29 July, 1878, pp. [88]–[90].

See part 3, No. 1643, p. 228.

— GODFREY, A. N. See No. 963.

949. GODING, F. W. "The army worm," *Leucania unipuncta* Haw. <Blackberry [Ill.] Blade, 28 July, 1881, v. 2, p. 1.

Ravages and means against *Leucania unipuncta*.

950. GODING, F. W. The 10-lined potato beetle, *Doryphora decemlineata* Say. <Blackberry [Ill.] Blade, 8 September, 1881, v. 2, p. 1.

History, life-history, times of appearance, ravages, and parasites, and means against *Doryphora 10-lineata*.

951. GODING, F. W. Insects injurious to vegetation in Iowa. <Rept. Iowa State Agric. Soc. for 1882, 1883, pp. 322-329. Reprint: <Ancona, Ill., Advocate Publ. Co., 1883, 11 pp.
General account of *Anisopteryx* [= *Paleacrita*] *vernata*, *Clisiocampa americana*, *Selandria* [= *Monophadnus*] *rubi*, *Phyllophaga* [= *Lachnosterna*] *fusca*, *Leucania unipuncta*, *Blissus leucopterus*, *Doryphora 10-lineata*, *Pionea rimosalis*, and *Pieris rapæ*; means against them.
952. GODING, F. W. Human parasites. <Chicago Medical Journal and Examiner, December, 1883.
953. GODING, F. W. Notes from Livingston and adjacent counties. <Trans. Dept. Agric. State of Illinois for 1885, 1886, v. 22, pp. 127-130.
Notes on the injuries of Elateridæ, Acridiidæ, *Eutrapela transversata*, and *Stenosphenus notatus*; of a dipterous larva in celery; the effects of *flacherie* in larvæ of *Pieris rapæ*; scarcity of *Blissus leucopterus* and abundance and destructiveness of *Eudemis botrana*.
954. GORHAM, D. B. The cotton worm, its history, character, visitations, etc, <De Bow's Commercial Review, 1847, v. 3, p. 535. <Southern Cultivator, 1847, p. 114. <De Bow's Industrial Resources, 1852, p. 158.
Natural history of *Aletia xyliana*; account of previous visitations; the migration theory; describes *Pimpla conquisitor*? a parasite on the *Aletia*.
955. GOTT, B. Report on some of our fruit insect enemies. <Ann. Rept. Ent. Soc. Ontario for the year 1877, 1877, pp. 40-47, figs. 21-36.
Records observations on *Clisiocampa americana*, *Ægeria tipuliformis*, *Nematus ventricosus* [= *ribesii*], *Pempelia grossulariæ* [= *Dakruma convolutella*], *Phyllophaga quercina* [= *Lachnosterna fusca*], *Agrotis* [= *Hadena*] *devastatrix*, *Doryphora 10-lineata*, *Pelidnota punctata*, *Haltica chalybea*, *Phylloxera vastatrix*, *Carpocapsa pomonella*, *Conotrachelus nenuphar*, *Pieris rapæ*, and *Arctia* [= *Pyrrehartia*] *isabella*; several of the species are figured; insect register for 1877.
956. GOTT, B. [*Lophyrus abbotii* attacking *Pinus strobus*.] <Can. Ent., May, 1878, v. 10, p. 99.
Description, habits, and ravages of *Lophyrus abbotii*.
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* Born at Königsberg, Prussia, 30 May, 1817; died at Cambridge, Mass., 9 November, 1893.

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U. S. DEPARTMENT OF AGRICULTURE.

DIVISION OF ENTOMOLOGY.

BIBLIOGRAPHY

OF

THE MORE IMPORTANT CONTRIBUTIONS

TO

AMERICAN ECONOMIC ENTOMOLOGY.

PREPARED BY AUTHORITY OF THE SECRETARY OF AGRICULTURE

BY

SAMUEL HENSHAW.

PART V.

THE MORE IMPORTANT WRITINGS

OF

GOVERNMENT AND STATE ENTOMOLOGISTS,

AND OF

OTHER CONTRIBUTORS TO THE LITERATURE OF AMERICAN
ECONOMIC ENTOMOLOGY.

L-Z.

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1896.

FORTY-SEVENTH CONGRESS, FIRST SESSION.

CONGRESS OF THE UNITED STATES,
IN THE HOUSE OF REPRESENTATIVES,

June 24, 1882.

Resolved, By the House of Representatives (the Senate concurring), that there be printed, for the use of the Department of Agriculture, one thousand copies of a special report entitled "Bibliography of Economic Entomology."

Attest:

EDW. MCPHERSON, *Clerk*.

Passed the Senate July 6, 1882.

F. E. SHOBER, *Acting Secretary*.

A true copy.

EDW. MCPHERSON, *Clerk*.

LETTER OF TRANSMITTAL.

UNITED STATES DEPARTMENT OF AGRICULTURE,
DIVISION OF ENTOMOLOGY,
Washington, D. C., October 15, 1896.

SIR: In transmitting for publication the final part of the Bibliography of the More Important Contributions to American Economic Entomology, the first part of which was published in 1890, it seems necessary, in view of certain public claims by Mr. B. Pickman Mann as to the authorship of the bibliography, to make a further statement for the information of those who may be interested in the question.

It became the writer's duty in 1889 to transmit for publication Parts I, II, and III, during the prolonged absence of the chief of the division. Mr. Henshaw's name appeared on the title page of these parts, as well as subsequent parts, as the author, and to this Mr. Mann has taken exception, as well as to the statement made by the writer in his original letter of transmittal, to the effect that the manuscript which he had prepared "was turned over in an incomplete and fragmentary condition" to Mr. Henshaw, who had "added greatly to it and practically rewritten portions already prepared." Subsequent investigation has convinced the writer that in this statement he did not give Mr. Mann sufficient credit, and this omission is hereby publicly acknowledged.

Nevertheless, the claims which Mr. Mann has made can not be reconciled with statements by Mr. Henshaw as to the condition of the manuscript when received by him and the difficulty in reconciliation is indicated by the following statement from Mr. Mann and introductory note from Mr. Henshaw:

MR. MANN'S STATEMENT.

This work was in its original conception modeled upon the bibliographical record of "Psyche," under my editorship, and I was employed in the preparation of it during my six years' connection with the Department of Agriculture. I completed more than five-eighths of the material, except the indexes, composing the first volume, mainly in Part III, and left this, at the time of the severance of my connection with the Division of Entomology, December 31, 1886, in condition for publication as prepared, together with about 5,000 titles of other articles, the latter largely without analytic notes, for the subsequent parts, and an estimated number of more than 18,000 index references to the same.

Of the titles prepared for the parts subsequent to Part III I find only the more important to have been published.

B. PICKMAN MANN.

WASHINGTON, *July 4, 1896.*

MR. HENSHAW'S INTRODUCTORY NOTE.

The publication of the final part of this bibliography renders an acknowledgment of the assistance received desirable.

Messrs. A. J. Cook, C. H. Fernald, S. A. Forbes, L. O. Howard, H. Osborn, F. M. Webster, and C. M. Weed kindly furnished data concerning their several publications, and the printed lists of Messrs. Asa Fitch, Townend Glover, T. W. Harris, William Le Baron, and J. A. Lintner have been freely used. The work of Messrs. A. S. Packard and J. S. Kingsley in the first stages of the bibliography should also be mentioned, and I especially desire to add an explicit recognition of the work of Mr. B. P. Mann.

Though an exact agreement between Mr. Mann and myself does not seem possible, I most willingly acknowledge that his work, especially in Part III, was both extensive and important. The original plan of the bibliography, like the bibliographical record published in "*Psyche*," was conceived by Mr. Mann, and during his connection with the Division of Entomology, from September 1, 1881, to December 31, 1886, he completed several thousand titles, besides amassing a large amount of miscellaneous data. I supplemented Mr. Mann's work with additional material and rewrote, reviewed, and, when possible, condensed the analytic notes of the parts prepared by Mr. Mann; introduced a uniform nomenclature of the scientific names, made the several indexes wholly anew, and read the proof.

SAMUEL HENSHAW.

CAMBRIDGE, *October 12, 1896.*

By mutual consent of Messrs. Mann and Henshaw the evidence upon which these two notes are based has been submitted to Dr. Theodore N. Gill, as an unprejudiced arbiter of the question as to the true authorship of the volumes. Dr. Gill decided, in a letter to the Assistant Secretary of Agriculture, dated April 20, 1896, "that the credit for the work and right to appear on the title page as editor properly belong to Mr. Henshaw."

The present part completes the work which can be done under the authority of the joint resolution of Congress dated July 6, 1882. It brings the Bibliography of American Economic Entomology down to June 30, 1888.

Efforts will be made to bring the bibliography down to date and to publish thereafter occasional supplements.

Respectfully,

L. O. HOWARD,
Entomologist.

Hon. J. STERLING MORTON,
Secretary of Agriculture.

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¹Dr. LeBaron was born at North Andover, Mass., 17 October, 1814, and died at Elgin, Ill., 14 October, 1876. See Ent. Amer., October, 1885, v. 1, pp. 122-125.

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* Born at Andover, Mass., 18 January, 1838; died at Providence, R. I., 4 June, 1884.

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* Born at Kingsport, Tenn., 27 July, 1825.

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